RUBELLA *(including congenital)*

DISEASE REPORTING

In Washington

DOH receives 5 to 15 reports of rubella per year.

Rubella is a vaccine preventable disease that has serious implications for pregnant women; it is important to prevent exposure of non-immune pregnant women.

Because of the potential for transmission of this serious infection, immediate public health action is required to identify and provide chemoprophylaxis for contacts of cases. Please call DOH Communicable Disease Epidemiology (1-877-539-4344) for specific recommendations.

Case reporting or inquiries may be addressed to DOH Communicable Disease Epidemiology or to the DOH Immunization Program.

Purpose of reporting and surveillance

- To prevent congenital rubella syndrome (CRS).
- To identify exposed pregnant women in a timely manner, determine their susceptibility and infection status, and provide or assure appropriate counseling about the risk of fetal infection.
- To assure that children with suspected CRS are tested.
- To educate potentially exposed persons about signs and symptoms of disease, thereby facilitating early diagnosis and preventing further transmission.
- To assist in the diagnosis and treatment of cases.
- To identify contacts and recommend appropriate preventive measures, including exclusion and immunization.
- To identify situations of undervaccination or vaccine failure.

Reporting requirements

- Health care providers: **immediately notifiable to Local Health Jurisdiction**
- Hospitals: **immediately notifiable to Local Health Jurisdiction**
- Laboratories: notifiable within 2 workdays; specimen submission required
- Local health jurisdictions: notifiable to DOH Communicable Disease Epidemiology within 7 days of case investigation completion or summary information required within 21 days

CASE DEFINITION FOR SURVEILLANCE

Clinical criteria for diagnosis

An illness that has all the following characteristics:

- Acute onset of generalized maculopapular rash
- Temperature >99.0ºF (>37.2ºC), if measured
- Arthralgia/arthritis, lymphadenopathy, or conjunctivitis.

Laboratory criteria for diagnosis

- Isolation of rubella virus, or
- Significant rise between acute- and convalescent-phase titers in serum rubella immunoglobulin G (IgG) antibody level by any standard serologic assay, or
- Positive serologic test for rubella immunoglobulin M (IgM) antibody.

Serum rubella IgM test results that are false positives have been reported in persons with other viral infections (e.g., acute infection with Epstein-Barr virus [infectious mononucleosis], recent cytomegalovirus infection, and parvovirus infection) or in the presence of rheumatoid factor. Patients who have laboratory evidence of recent measles infection are excluded.

Case definition

- Probable: a case that meets the clinical case definition, has no or noncontributory serologic or virologic testing, and is not epidemiologically linked to a laboratory confirmed case.
- Confirmed: a case that is laboratory confirmed or that meets the clinical case definition and is epidemiologically linked to a laboratory-confirmed case.

CONGENITAL RUBELLA

Clinical criteria for diagnosis

Presence of any defect(s) or laboratory data consistent with congenital rubella infection. Infants with congenital rubella syndrome usually present with more than one sign or symptom consistent with congenital rubella infection. However, infants may present with a single defect. Deafness is most common single defect.

- Cataracts/congenital glaucoma, congenital heart disease (most commonly patent ductus arteriosus, or peripheral pulmonary artery stenosis), loss of hearing, pigmentary retinopathy
- Purpura, splenomegaly, jaundice, microcephaly, mental retardation, meningoencephalitis, radiolucent bone disease.

Laboratory criteria for diagnosis

- Isolation of rubella virus, or
- Demonstration of rubella-specific immunoglobulin M (IgM) antibody, or
- Infant rubella antibody level that persists at a higher level and for a longer period than expected from passive transfer of maternal antibody (i.e., rubella titer that does not drop at the expected rate of a twofold dilution per month), or
- PCR positive rubella virus.

Case definition

- Probable: a case that is not laboratory confirmed and that has any two complications listed in paragraph 1 of the clinical description or one complication from paragraph 1 and one from paragraph 2, and lacks evidence of any other etiology.
- Confirmed: a clinically compatible case that is laboratory confirmed.
- Infection only: a case that demonstrates laboratory evidence of infection, but without any clinical symptoms or signs.

In probable cases, either or both of the eye-related findings (i.e., cataracts and congenital glaucoma) are interpreted as a single complication. In cases classified as infection only, if any compatible signs or symptoms (e.g., hearing loss) are identified later, the case is reclassified as confirmed.

A. DESCRIPTION

1. Identification

Rubella is a mild febrile viral disease with a diffuse punctate and maculopapular rash sometimes resembling that of measles or scarlet fever. Children usually present few or no constitutional symptoms, but adults may experience a 1-5 day prodrome of low grade fever, headache, malaise, mild coryza and conjunctivitis. Postauricular, occipital and posterior cervical lymphadenopathy is the most characteristic clinical feature and precedes the rash by 5-10 days. Up to half the infections occur without recognized rash. Leukopenia is common and thrombocytopenia can occur, but hemorrhagic manifestations are rare. Arthralgia and, less commonly, arthritis complicate a substantial proportion of infections, particularly among adult females. Encephalitis and thrombocytopenia are rare complications in children; encephalitis occurs more frequently in adults.

Rubella is important because of its ability to produce anomalies in the developing fetus. Congenital rubella syndrome (CRS) occurs in up to 90% of infants born to women who are infected with rubella during the first trimester of pregnancy; the risk of a single congenital defect falls to approximately 10%-20% by the 16th week, and defects are rare when the maternal infection occurs after the 20th week of gestation.

Fetuses infected early are at greatest risk of intrauterine death, spontaneous abortion and congenital malformations of major organ systems. These include single or combined

defects such as deafness, cataracts, microphthalmia, congenital glaucoma, microcephaly, meningoencephalitis, mental retardation, patent ductus arteriosus, atrial or ventricular septal defects, purpura, hepatosplenomegaly, jaundice and radiolucent bone disease. Moderate and severe cases of CRS are usually recognizable at birth; mild cases with only slight cardiac involvement or partial deafness may not be detected for months or even years after birth. Insulin dependent diabetes mellitus is recognized as a frequent late manifestation of CRS. Congenital malformations and even fetal death may occur following inapparent maternal rubella.

Differentiation of rubella from measles, scarlet fever and other similar exanthems is often necessary. Macular and maculopapular rashes also occur in 1%-5% of patients with infectious mononucleosis (especially if given ampicillin), in infections with certain enteroviruses and after certain drugs.

Clinical diagnosis of rubella is often inaccurate. Laboratory confirmation is the only reliable evidence of acute infection. Rubella infection can be confirmed by a significant rise in specific antibody titer between acute and convalescent phase serum specimens by ELISA, HAI, passive HA or LA testing, or by the presence of rubella specific IgM indicating a recent infection.

Sera should be collected as early as possible (within 7-10 days) after onset of illness, and again at least 7-14 days (preferably 2-3 weeks) later. Virus may be isolated from the pharynx 1 week before and up to 2 weeks after onset of rash. Blood, urine or stool specimens may yield virus. However, virus isolation is a lengthy procedure requiring 10-14 days. The diagnosis of CRS in the newborn is confirmed by the presence of specific IgM antibodies in a single specimen, by the persistence of a rubella specific antibody titer beyond the time expected from passive transfer of maternal IgG antibody, or by isolation of the virus that may be shed from the throat and urine for as long as a year. Virus may also be detected in cataracts for up to the first 3 years of life.

2. Infectious Agent

Rubella virus (family Togaviridae; genus Rubivirus).

3. Worldwide Occurrence

Worldwide; universally endemic except in remote and isolated communities, especially on certain island groups that have epidemics every 10-15 years. It is prevalent in winter and spring. Extensive epidemics occurred in the US in 1935, 1943 and 1964, and in Australia in 1940. Before vaccine was licensed in 1969, peaks of rubella incidence occurred in the US every 6-9 years. Throughout the 1990s the incidence of rubella in the US declined steadily. However, the percent of cases among the foreign born increased steadily during the same period. During the 1990s, rubella outbreaks occurred in the US in workplace settings, institutions, communities, and other environments where adolescents and young adults congregate, and have been primarily sustained by persons who have not been included in vaccine programs.

4. Reservoir

Humans.

5. Mode of Transmission

Contact with nasopharyngeal secretions of infected people. Infection is by droplet spread or direct contact with patients. In closed environments such as among military recruits, all exposed susceptibles may be infected. Infants with CRS shed large quantities of virus in their pharyngeal secretions and in urine, and serve as a source of infection to their contacts.

6. Incubation period

From 14-17 days with a range of 14-21 days.

7. Period of communicability

For about 1 week before and at least 4 days after onset of rash; highly communicable. Infants with CRS may shed virus for months after birth.

8. Susceptibility and resistance

Susceptibility is general after loss of transplacentally acquired maternal antibodies. Active immunity is acquired by natural infection or by immunization; it is usually permanent after natural infection and thought to be long term, probably lifelong, after immunization, but this may depend on contact with endemic cases. In the US, about 10% of the general population remain susceptible. Infants born to immune mothers are ordinarily protected for 6-9 months, depending on the amount of maternal antibodies acquired transplacentally.

B. METHODS OF CONTROL

1. Preventive measures:

Rubella control is needed primarily to prevent defects in the offspring of women who acquire the disease during pregnancy.

a. Educate the general public on modes of transmission and the need for rubella immunization. Education by health care providers should encourage rubella immunization for all susceptible persons. Efforts should be intensified to immunize susceptible adolescents and young adults; assessment of the immunity status of those born outside of the US should be given particular attention.
b. A single dose of live, attenuated rubella virus vaccine (Rubella Virus Vaccine, Live) elicits a significant antibody response in approximately 98%-99% of susceptibles. The vaccine is in dried form and after reconstitution must be kept at 2-8°C (35.6-

46.4°F) or colder and protected from light to retain potency. Vaccine virus may be recovered from the nasopharynx of some recipients during the second to the fourth week postimmunization, more commonly for only several days, but is not communicable. In the US, immunization of all children is recommended at 12-15 months of age as part of a combined vaccine containing measles and mumps vaccine (MMR), with a second dose of MMR at school entry or at adolescence. The continuing occurrence of rubella among those born outside the US indicates that emphasis should be placed on immunizing this population. Vaccine is recommended for all susceptible nonpregnant females without contraindications. Susceptible young adults who have contact with young children or congregate at colleges and other types of institutions should be immunized. All medical personnel should be immune to rubella, in particular those who are in contact with patients in prenatal clinics. Proof of immunity is indicated by presence of rubella specific antibodies or written documentation of receiving rubella vaccine on or after the first birthday.

Vaccine should not be given to anyone with an immunodeficiency or on immunosuppressive therapy; however, MMR is recommended for persons with asymptomatic HIV infection. MMR should be considered for persons with symptomatic HIV infections. Because of theoretical concerns, women known to be pregnant or who are planning to get pregnant in the next 3 months, should not be immunized. However, results from a registry at CDC indicated that of 321 women who received rubella vaccine during pregnancy, all gave birth to full-term, healthy infants.

Reasonable precautions in a rubella immunization program include asking postpubertal females if they are pregnant, excluding those who say they are, and explaining the theoretical risks to the others and emphasizing the need to prevent pregnancy for the next 3 months. The immune status of an individual can be determined reliably only by serologic testing, but this is not necessary before immunization since vaccine can be given safely to an immune person. In some countries, routine immunization is given to girls between 11 and 13 years of age with or without prior antibody testing. In many countries, including the US, Australia and the Nordic countries, a second dose of MMR vaccine is recommend for teenagers of both genders. For greater general detail, see MEASLES, B1a.

c. In case of natural infection early in pregnancy, abortion should be considered because of high risk of damage to the fetus. In studies carried out among pregnant women inadvertently immunized, congenital defects in live born infants have not been found; therefore, immunization of a woman subsequently discovered to be pregnant need not be considered an indication for abortion, but the potential risks should be explained. The final decision rests with the individual woman and her physician.
d. IG given after exposure early in pregnancy may not prevent infection or viremia, but it may modify or suppress symptoms. It is sometimes given in huge doses (20 ml) to a susceptible pregnant woman exposed to the disease who would not consider abortion under any circumstances, but its value has not been established.

2. Control of patient, contacts and the immediate environment:

a. Report to local health authority. Early reporting of suspected cases will permit early establishment of control measures.
b. Isolation: In hospitals and institutions, patients suspected of having rubella should be managed under contact isolation precautions and placed in a private room; attempts should be made to prevent exposure of nonimmune pregnant women. Exclude children from school and adults from work for 7 days after onset of rash. Infants with CRS may shed virus for prolonged periods of time. All persons having contact with infants with CRS should be immune to rubella, and these infants should be placed in contact isolation. Isolation precautions should be regulated during any admission before the first birthday, unless pharyngeal and urine cultures are negative for virus after 3 months of age.
c. Concurrent disinfection: None.
d. Quarantine: None.
e. Immunization of contacts: Immunization, while not contraindicated (except during pregnancy), will not necessarily prevent infection or illness. Passive immunization with IG is not indicated (except possibly as in B1d, above).
f. Investigation of contacts and source of infection: Identify pregnant female contacts, especially those in the first trimester. Such contacts should be tested serologically for susceptibility or early infection (IgM antibody) and advised accordingly.
g. Specific treatment: None.

3. Epidemic measures

a. Prompt reporting of all confirmed and suspected cases and immunization of all susceptible contacts are needed for outbreak control.
b. The medical community and general public should be informed about rubella epidemics in order to identify and protect susceptible pregnant women.

4. International measures

None.